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AUTHOR Parnell, Dale
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ABSTRACT

Within the context of a discussion of the future of work in the United States, this paper proposes the development of a four-year structured and closely articulated program of technical preparation, beginning during the junior year of high school and terminating with specific technical education programs in community, technical, and junior colleges. First, introductory comments look at current needs and expectations from work and life, changing demands of the labor market and future employment skill needs, and expectations for an increase in the demand for workers with a middle range of skills. The next section looks at the job skills that will be required of the technician of the future, followed by a brief summary of the educational issues that have emerged from recent reports calling for change and reform at all levels. In response to these demands, the next section advocates the development of the 2 + 2 Tech Prep/Associate Degree program to provide access to a mid-level range of career choices. A review of existing models of high school/college partnerships is followed by a list of assumptions upon which the degree program would be based, a description of how the program would operate, and the ways in which the program could address current concerns about education. Finally, a Tech-Prep Fact Sheet, sample help wanted ads of the future, and charts showing sample articulated programs are presented. (LAL)

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2 + 2 TECH PREP/ASSOCIATE DEGREE PROGRAM

A WORKING DEGREE FOR AMERICA

A CONCEPT PAPER

BY

DALE PARNELL
PRESIDENT
AMERICAN ASSOCIATION OF COMMUNITY AND JUNIOR COLLEGES

OCTOBER 1984

THIS STATEMENT WAS DEVELOPED WITH THE ASSISTANCE OF NANCY ARMES, ADMINISTRATIVE ASSISTANT TO THE CHANCELLOR OF THE DALLAS COUNTY COMMUNITY COLLEGES

JC 840 565

American Association of Community and Junior Colleges
One Dupont Circle, N.W., Suite 410
Washington, D.C. 20036
202/293-7050

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2+2 TECH PREP/ASSOCIATE DEGREE PROGRAM
A WORKING DEGREE FOR AMERICA

"We are living in the time of the parenthesis, the time between eras," John Naisbitt tells us. It is a time of ambiguity, of change, and questioning, a time electric with possibilities when a single model for achievement will always be limiting, a time when, Naisbitt suggests, "those able to anticipate the new era will be a quantum leap ahead of those who hold on to the past."

For community college educators, it is a time when the variety of excellence we aspire to represent in higher education must match, in sufficient portions, the variety of challenges presented to us. Trend analysts, forecasters, policy-makers, strategic planners--all find dramatic ways to underscore what we have already begun to understand in a visceral way. The information age, sped by technological advance, presents a richer, more complex reality in which human beings seem to want more of life and work.

They want the range of choice extended, so that their lives and work are not unnecessarily degrading or boring or limiting.

They want to participate more, with collaborations, teams, and networks becoming more descriptive of institutional life and organizational processes.

They want connectedness, the ability to see relationship between what they do and the larger whole, between themselves and their associates.

They want to continue to learn through a career, to avoid obsolescence and to restore personal energy.

They want greater control over the variables that make up their work lives, as a kind of fail-safe device against the level of complexity with which they must deal.

They want coherence and have less patience with wasted effort.

They want greater structure and substance in their educational programs.

If these needs and expectations are used as signposts to help us formulate a more accurate profile of America's future work force, a slightly out-of-focus picture begins to gain clarity. If a higher quality of work life is to become a reality for millions of Americans, perhaps the most fundamental emerging truth is that higher and more comprehensive skills must be developed, particularly by the middle two quartiles of the work force. More sophisticated manual as well as conceptual skills will be in demand, and this worker cohort will be consistently pushed to handle a broader range of job requirements. Because of increased demand, more tasks once reserved for baccaluareate degree or advanced degree performers must be assumed by those with fewer years of education and training, and all workers will need to learn throughout a career to remain useful.

Not only do we anticipate that these demands will surface in the future, but we know what human resources will be available to meet these demands: All who will be part of the work force in the year 2000 are alive today. Thus we can extrapolate much from the age, sex, ethnic, and regional mixes with which we will be working. Our experience level alone suggests that it will be easier to create an information age work force than to maintain one. Since we know less about job replacement than job placement, more about training than retraining, we must learn quickly the lessons of program articulation and continuity in the learning process.

We have been told that more people in our society will be working at low skill jobs--i.e., clerks, custodians, waiters. But sheer volume of numbers does not give an accurate picture of future employment skill needs, especially for educators trying to meet new competency requirements created by an information society. Occupational Employment Projections list the 20 <u>fastest growing occupations</u> from 1988 through 1995. None can be classified as low skill--needing only a high school degree, only <u>two</u> obviously require a bachelor's degree. The remaining eighteen are occupations for which community, technical, and junior colleges provide training.

We will need custodians and waiters, but it is more myth than reality that technology will diminish the need for workers professing a middle range of skills. That need will grow--dramatically! During the last decade, we have been in the beginning of a "product life-cycle," as we first embraced the information age. This initial phase has been pushed along by the more advanced skills of scientists, engineers, and top level management. However, with growth and maturity, with what Bobby Inman describes as the "commercialization of technology," the volume of need for a mid-range of workers (which this report designates technicians) will grow. These workers will help us maintain and adapt existing information age systems.

Table 1
1983 and 1984 Comparisons
Occupational Status of the Employed

Occupation	Civilian employed	
	Aug. 1983	Aug. 1984
Total, 16 years and over	103,167	106,694
Managerial and professional speciality	20,044	24,460
Executive, administrative and managerial	10,814	11,789
Professional specialty	12,230	12,671
Technical, sales and administrative support	31,840	32,924
Technicians and related support	3,091	3,175
Sales occupations	12,140	12,891
Administrative support, including clerical	16,608	16,858
Precision production, craft and repair	12,794	13,641
Mechanics and repairers	4,230	4,477
Construction trades	4,602	5,023
Other precision production, craft and repair	3,963	4,141
Operators, fabricators and laborers	16,498	17,193
Machine operators, assemblers and inspectors	7,905	8,105
Transportation and material moving occupations	4,198	4,480
Handlers, equipment cleaners, helpers and laborers	4,396	4,608
Construction laborers	674	732
Other handlers, equipment cleaners, helpers and laborers	3,721	3,875
Service occupations	14,510	14,291
Private household	1,015	1,000
Protective service	1,827	1,757
Service, except private household and protective	11,667	11,535
Farming, forestry and fishing	4,481	4,185

A SCENARIO FOR THE FUTURE OF WORK

> "The main implication for education of the saturation of society with technology is that understanding technology becomes a primary concern....It is not true that understanding science and mathematics conveys an equal understanding of technology."
>
> —Educating Americans for the 21st Century
> National Science Foundation

Naisbitt traces the occupational history of the United States from farmer to laborer, to clerk, from rural to blue collar to white collar America. He invites us to speculate about the new worker that will characterize our society as we move past the parenthesis, into a new era.

Obviously what is needed as a new standard bearer is a worker who has developed a cluster of skills that reflects many of the critical trends encapsulated above, a worker who is less narrowly focused and whose responsibilities span several work areas. What is needed is a technician, if by that term we are describing an employee who:

* understands the basic principles of technology in an information age saturated with the use of technology.
* connects practice and theory in the work world.
* identifies problems and then analyzes, tests, and troubleshoots to find solutions.
* integrates the interests of complementary work areas.
* works independently much of the time, under the general supervision of a highly skilled, frequently more narrowly specialized professional.
* works willingly and well with his/her hands as well as with the brain.
* has mastered a basic skills package that includes a core of competence in math, science, computer science, and communications.

In its recent report, looking at the quality of learning under its purview, the National Science Foundation warned that technology must be considered a new entity by educators, not an extension of science and mathematics. Foundation analysts further warned that if technology becomes an isolated content domain, our society will create more problems than it will solve. Their conclusions about the effect of technology on science and math apply to the broad spectrum of career interests in this nation. Technology can compartmentalize us more or make us more responsive. It can create greater understanding and involvement within the work force or it can isolate us, one from the other.

This concept paper proposes that, as defined here, the technicial will characterize the mainstream development of our nation's work force in the future. The occupational history of this country will chronicle from farmer to laborer to clerk to technician. Technicians will become the glue that holds together the thousands of potentially isolated elements in our work world. They will be the professionals who understand and can apply underlying principles, who have enough knowledge an judgement to break down arbitrary barriers, who are generalists enough to spot waste and duplication in the organization, who have practical skills to address typical problems that arise.

THE PRESS OF PRESENT CIRCUMSTANCE

As educators, in a score of national reports, we have been told we must respond. We have heard a call for change and reform at all levels. The information revolution, it seems, has made the weaknesses in our educational programs more visible. The heart of the message we have heard from politicians and parents and policy-makers: Give us more structure. Give us more substance. Make us more certain that the materials and scaffolding of our educational structures match our sense of what an excellent education is about.

In the process, indirectly, these analysts have asked community, technical, and junior colleges to grapple with a host of perplexing patterns and problems. These colleges obviously must build on secondary school preparation. Again and again as the first wave of reports concentrated on K-12, nagging problems at the seondary school level focused immediate concerns for community colleges, and indeed, tended to call attention to articulation weaknesses or omissions. Briefly here are issues that have emerged.

Slippage

> "I would put the subject of school dropouts first. It is absolutely astounding to me that so many intelligent people could look for so long at American schools and say so little about this problem."
>
> --Harold Howe
> Harvard University School of Education

Secondary schools should prepare students for the next step, whatever that step may be. But the numbers wuld tell us that they do not prepare all. According to the 1980 Census, just over 30 pecent of high school students drop out, and there has been a 5 1/2 percent increase in that percentage from 1972 to 1982. Of the pool that does graduate,

about a third move into postsecondary education, but only 17 percent of that group complete a baccalaureate degree by age 25. Within the articulation patterns of these students, there are worrisome indicators of slippage:

About a third of high school graduates complete a "general" curriculum as opposed to college preparatory or vocational programs. Generally speaking, these graduates receive less career counseling, have fewer marketable skills, and are unlikely to find the kinds of work that can be seen as an initial step in a career ladder, at least for several years. Their expectations are fuzzy and unrealistic.

Almost another third of high school graduates finish vocational programs. But the percent trained as technicians is very low (1%). Almost 50 percent of high school vocational training is in agriculture, home economics, and industrial arts, areas that do not reflect the most pressing needs of the marketplace.

Nor do high schools have the resources to mount technical education programs that more nearly reflect the needs of the marketplace. As community colleges well know, such training programs are expensive and constantly in need of update. In addition, students pursuing vocational specialization at the high school level do not generally receive stringent basic skills training. If they do not find work related to their training, they are likely unemployment candidates.

If projections hold, between now and 1990, the number of students that finish baccalaureate degrees will remain relatively stable, but the number seeking further training beyond high school will continue to increase by 10 percent. Generally speaking, those high school students coming to community colleges for further training will already be hampered by poor decisions.

Nationally, community college retention figures hover at 50 percent. From semester to semester, we hold only about half the students who come to us. The reasons are numerous and complex, but the effect of this slippage is significant.

We must provide more models designed to slow the slippage to bring more structure and substance to the curricular program, to make program and degree completion more likely. This concept proposes one such model.

Continuity

> "Vocational/technical training has been community colleges' outstanding success, but you have not thought out your linkage with high schools."
>
> --Governor Bruce Babbitt
> State of Arizona

Research and experience tell us that students work better with goals, indeed so do we all. Yet there is a lack of clarity in what high schools and postsecondary institutions expect of their students. There is poor program articulation between these two educational entities; and even more serious, there is a subtle but stubborn provincialism that suggests that articulation--the careful building of bridges between high schools and colleges, or evaluation--the careful measure of success or failure, are extraneous to the primary mission of either group. A recent survey of community colleges reveals that 75 percent of the colleges report little or no program coordination with feeder high schools.

The national reports have given only cursory attention to the need for continuity in learning, forgetting all the dangerous lessons that the business world has learned of late--when the left hand does not really understand what the right is about. Again, the indicators are not difficult to find.

> The concern that high school students are still not concentrating on developing the "new basics" has been confirmed in a study by the National Center for Educational Statistics. The study found that students are not taking recommended loads in such "new basic" subjects are mathematics, science, and computer science. Interestingly, in the twelfth grade, the senior year, fewer courses

were completed in these new targeted areas than in any other high school year, even though these seniors were below recommended guidelines.

High schools do not have a good sense of how their students perform once at college or in the work world. While we have no clear evaluative data about these transitions, community colleges must deal with students who have failed to reach their own or others expectations upon high school graduation.

General speaking, the courses a student takes are not important in getting into college, although they may be critical to success once a student is there. In about half of the nation's colleges, there are no specific course requirements for admission.

Students do not have realistic expectations about what constitutes college level work or how a particular career choice dictates a pattern of study. A recent Penn State University study of freshmen found that 90 percent expected to have a "B" grade point average. Sixty percent of the survey group estimated they would study fewer than 20 hours a week. Eighty percent knew little about their major.

We must build more substantive partnerships with high schools. We must share information and expectations with each other and our students. This concept paper proposes one such partnership.

Structure and Substance

"During what now seems like a golden age of American education, there were two clear, specialized tracks. There was a good academic track for the university-bound students and a good vocational track for work-bound students. The "general" track--which led to limbo--was small. But the Excellence Commission notes that the number of students on this general track, this track leading nowhere, has increased from one in eight to nearly one in two. And that, more than anything, is the center of the problem."

--Marvin Feldman
President
New York Fashion Institute of Technology

While the national reports acknowledge the need for substance and structure, they also explicitly and implicitly acknowledge the primary reason that issues of quality have been raised: education at all levels has not kept pace. A general education track provides little structure, and insufficient substance or motivation for most ordinary students. The body of knowledge is reconfiguring around us and we have discoverd that many students are ill-equipped to deal with the changes. Both high schools and colleges must meet this challenge. They must set aside the safety and security of familiar patterns when necessary.

Certainly such change is not easy. Too often our caution and reluctance to let go of the familiar bog us down, as indicators again highlight.

> Employers designate the ability to learn as the essential hallmark of the successful employee. Yet, in all educational arenas we still spend little time on process skills--problem-solving, synthesis, analysis, critical thinking, etc. Upper level high school science and math continues to be too abstract and theoretical for perhaps two-thirds of the student body who desperately need more practical skills development in math and science.
>
> A dusty debate continues. The Morrill Act of 1862 was to promote practical and liberal education for an agrarian society. Yet land grant colleges and the rest of postsecondary education have still not resolved what practical means, nor have they managed a happy marriage of the two.
>
> The definitions and use of tools are pointedly absent from the education of young people. Yet the practical expressions such tools represent are essential to the quality of work we produce in a technological world.
>
> The urgent request that basic skill development must be a part of vocational programs is now familiar; yet, generally speaking, neither high schools nor community colleges have built interdisciplinary configuarations necessary to bring this about.
>
> A broad-based systems approach to technicial training will discourage career obsolesence, we are told. But in practice, the new courses most often added to degree plans reflect an increasing specificity of emphasis.

> And perhaps the key struggle for community colleges is that as open-door colleges, they have side-stepped the need to clearly state their own preparation expectations for incoming students. If they are to have the best chance for success in our colleges, high school students must have a clear sense of what it will take to succeed. Young people hold only vague notions of what adequate preparation for a community college experience means.

The challenge of the open door is to find ways to increase healthy risk to bring change. New models, new reconfigurations will occur only when the needs of students are placed above special interest claims. This concept paper proposes one such model.

2 + 2 TECH PREP/ASSOCIATE DEGREE PROGRAM

A PARTNERSHIP AMERICA NEEDS

> "...there is surprisingly little attention given to 'ordinary people' in the school reform reports. There is the clear implication that the rising tide of mediocrity is made up of embarrassing numbers of ordinary people, and if we want to return excellence to education, we better go out and find more excellent people."
>
> —Pat Cross
> Harvard University School of Education

This concept paper advocates taking a step beyond current high school/college partnership agreements. Furthermore, it is targeting ordinary students...the high school student not part of the college prep track. It is offering that large group (almost two thirds of high school graduates) a quality program that will provide access to a mid-level range of career choices.

A History on Which to Build

Many postsecondary institutions have initiated high school/college partnerships and program articulation programs. The programs seem to fall into four major categories:

1. Joint enrollment is the most common cooperative program. The primary purpose of joint enrollment is to provide a stimulating challenge for students who need more than the standard high school and/or college credits. Some state level funding formulas reward both schools and colleges for joint enrollment participation. It is estimated that 28,000 high school students are involved in such programs.
2. Sharing of faculty and/or facilities is another form of cooperation. High school students often will take classes in a nearby community college facility. Such classes often will be led by a community college faculty member.

Although not as common, at other times, college faculty go to the high school to teach a class.

3. Advance Placement is a program aimed at motivating academically talented students to earn college credit while still in high school. Even though placement is primarily determined by tests, an increasing number of colleges are offering advance placement credit via the joint enrollment process.

4. Program articulation efforts, though few and far between, are increasing. High school and college faculty and administration are developing written program articulation agreements. These agreements are most often found in vocational/technical courses and programs.

Tech-Prep/Associate Degree Assumptions

> "Like it or not, our educational institutions have little choice but to change with the times. Either that or be left in the wake of untold technological breakthrough."
>
> --Jobs for the 21st Century

Taking into account the trends and patterns described in the first half of this paper, a second more focused set of assumptions with specific implications for the creation of a tech-prep program must be recognized.

1. Community, technical, and junior colleges have a special responsibility to give clear signals to high school students about preparatory requirements.
2. Similarly students need more descriptive programs that help them plan for future employment. It is clear that many students need a clearer focus for their efforts. Aimlessness is one of the plaques of both secondary and college students.
3. Much greater emphasis must be given to helping students who are not in college prep coursework understand basic principles that undergird their lives and work.
4. The Associate Degree can logically become the preferred degree for most mid-level occupations. That pattern of acceptance has begun and must be encouraged.
5. Many emerging technical/occupational training programs cannot be completed in two years, particularly if the student is given strong basic skills preparation. More time is required.
6. A "job cluster" program can tie curriculum to the goals of students in such a way that they are motivated while in school, and also better equipped to take that next step. A tech-prep program accomplishes this clustering.

7. A closely articulated four-year technical education program will provide more adequate room for electives than the current two-year college program. This will increase the likelihood of a quality general education experience for students not pursuing a baccalaureate degree.

8. Tech prep is one way to apply the tests of rigor and excellence so often associated with college prep programs, but to the experiences of high school students who are part of a general program (39%) or part of a high school vocational program (27%).

9. This program's audience is much broader than the needs of the "high technology" marketplace. The 2+2 technician will be suited for a wide array of mid-level occupations.

The 2 + 2 Tech Prep Associate Degree Program

> "A broad-based systems approach to technician training will prevent obsolescence and permit the techinician to be adaptable to contiuning change.
>
> --Robert Steely
> Kellogg Community College

The 2 + 2 Tech Prep/Associate Degree program is a four-year program intended to parallel the current college prep/baccalaureate degree programs. It calls for a blending of general education and vocational education. Its foundation is basic skill development in math, science, communications, and technology--all in an applied setting.

Beginning with the junior year in high school, students will select the tech-prep program (even as they now select the college-prep program) and continue for four years in a structured and closely articulated curriculum. They will be taught by high school teachers in the first two years and will have access to college personnel and facilities when appropriate. Starting with a solid base of applied science, applied math, literacy courses, and technical programs, the high school portion of the career program will be intentionally preparatory in nature. Built around career clusters and technical systems study, such a tech prep approach will help students develop broad-based competence in a career field and avoid the pitfalls of more short term and narrowly delineated job training.

This high school tech-prep program will then dovetail with specific technical education programs in community, technical, and junior colleges. At the college level, more intense technical specializations will be developed, always in tandem with broad technical competence and broad education competence.

It is anticipated that one end result of this program will be the enhancement of the associate degree to the point that it will become the preferred degree for employers seeking to fill a broad range of mid-level occupations. As a result of employer demand, students will seek the degree and view the degree as a preferred career development goal.

Making the Partnership Work

All of this will require close curriculum articulation...and most importantly will require high school leaders and community college leaders to talk regularly with one another, and with employers.

If it succeeds, the tech prep/associate degree concept will provide a dramatic model for educators wishing to avoid slippage, loss of contiunity in learning, and bring more program structure and substance as they serve the needs of all students. Specifically,

* Students will develop sound general skills and knowledge.
* Students will obtain first-rate technical preparation.
* High schools will motivate more students and perhaps lose fewer between grades 10 and 11.
* Community colleges will gain better prepared high school graduates.
* For all, a 2 + 2 tech-prep/associate degree program will encourage more high school students to continue their education in meaningful ways.
* Employers will gain better prepared employees.

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TECH-PREP FACT SHEET

* 55 percent of entering freshmen in all higher education begin their college career in a community, technical, or junior college.

* 83 percent of the adult population does not hold a bachelor's degree.

* 25 percent, or 1 out of 4, students do not complete high school.

* The high school drop-out rate increased 5 1/2% between 1972 and 1982.

* The 20 fastest growing occupations in 1982-1995 all prefer postsecondary education and training, e.g., computer science technician, office machine service technician, engineering technician, banking and insurance personnel. Only 2 of the 20 require a baccalaureate degree.

* As reported by high school graduates in the National Longitudinal Study of the Class of 1980, programs of study completed were:

Academic (College prep)	—	34%
Vocational	—	27%
General	—	39%

* The Southern Regional Education Board reports that less than 1 percent of the high school students in vocational programs that train for specific occupations are in technical education programs.

* The American Electronic Association report entitled, "Technical Employment Projections, 1983-87," indicates that the electronics industry will need 60 percent more technicians by 1987 than were employed in 1983. That means 115,000 new electronic technician jobs will be needed by 1987, in addition to other worker replacements.

* Private sector employment growth in the future will be in companies with 50 or fewer emloyees.

* The Associate Degree is becoming the preferred degree for entry in many technician occupations.

* American private sector business and industry spends an estimated $30 billion a year on the education and training of 11 million employees.

* All who will be in the work force by the year 2000 are alive today.

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* A recent Penn State University study indicates that 98 percent of entering college students in 1982 and 1983 expect a "B" grade point average in college. Sixty-one percent estimated they would study fewer than 20 hours per week.

* The same Penn State study found that 80 percent of entering college students said they knew little or nothing about their choice of major.

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HELP WANTED ADS OF THE FUTURE

These seven ads typify the shifts that are coming in the nation's job market, changes that are bound to impact the education and training of the work force of the future.

GERIATRIC SOCIAL WORKER: Inner-city private nursing home, immediate opening for capable, reliable person. Must be L.P.N. or have equivalent education. Salary $16,000 thru $22,000 depending on experience. References required. Equal Opportunity Employer. Associate Degree Preferred with Broad Education Background.

LASER PROCESS TECHNICIAN: High-technology firm needs dependable, experienced laser technician. Should have two years related laser cutting machine experience or will train. Flex time and day care available. Job sharing and shared dividends. Salary $16,000 to $25,000 negotiable. E.O.E. Associate Degree Preferred with solid math and science background.

GENETIC ENGINEERING TECHNICIAN: Positions available for both process technicians and engineering technicians. Relocation. Must have two years technical education and training. Additional education paid by company. Moving expenses paid by firm. Company will buy your present home. $20,000 to $30,000. E.O.E. Associate Degree Preferred with Broad Science Background.

BATTERY TECHNICIAN: Large oil firm needs five technicians with previous experience in fuel cells or high-energy batteries. Shift work, O.T. available, dressing rooms and private locker, discount on all corporate products. Education and managerial training available. $15,000 to $20,000. E.O.E. Associate Degree Preferred.

ELECTRONIC TECHNICIAN: Small electronics company needs dependable and broadly educated technician. Must be knowledgeable of fluid power systems, mechanical systems, as well as electrical systems. Flex-time available.

Company stock plan available. Salary $18,000 to $28,000 negotiable. E.O.E. Associate Degree Preferred.

STAFF ASSISTANT: County Tax Assessor needs dependable executive secretary skilled in use of word processor and microcomputer. Must have good interpersonal skills with ability to remain calm in conflict situations. Salary range: $16,000 to $24,000. E.O.E. Associate Degree Preferred with Broad Educational Background.

POLICE OFFICER: City of Serenity needs police officer who has completed an associate degree law enforcement training program or graduate of a police academy. Excellent communication skills required. Preference in the point system will be given to those candidates able to communicate easily in Spanish. Salary $20,000 to $30,000 with excellent fringe package. E.O.E. Associate Degree Preferred with Broad Educational Background.

KERN HIGH SCHOOL DISTRICT AND BAKERSFIELD COLLEGE
AGRICULTURE BUSINESS

GRADE 11 FALL		GRADE 12 FALL		GRADE 13 FALL		GRADE 14 FALL	
COURSES	SITE	COURSES	SITE	COURSES	SITE	COURSES	SITE
American History	HS	American Government	HS	English-Composition (3)	BC	*English-Technical Writing (3)	BC
English	HS	English	HS	Humanities (3)	BC	Behaviorial Science (3)	BC
Mathematics	HS	Conversational Spanish	HS	Ag. Bus. 5—Ag. Computers (3)	BC/C	Physical Fitness	BC
Physical Science or Chemistry	HS	P.E. or Elective	HS	Acctg. 53A Intro. to Accounting (3)	BC	Ag. Bus. 7—Calif. Agriculture Law	BC
Typing/Computer Intro.	ROP	Technical Math (3)	C	Elective (3)	BC/C	Elective (3)	BC/C
Ag. Bus.1—Intro. to Cal. Ag. (3)	BC/C	Ag. Bus. 3—Ag. Mkt. & Econ. (3)	BC/C				

GRADE 11 SPRING		GRADE 12 SPRING		GRADE 13 SPRING		GRADE 14 SPRING	
COURSES	SITE	COURSES	SITE	COURSES	SITE	COURSES	SITE
American History	HS	American Government	HS	English-Speech (3)	BC	Humanities (3)	BC
English	HS	English	HS	Ag. Bus. 6—Ag. Labor Relations (3)	BC	Fine Arts (3)	BC
Mathematics	HS	Conversational Spanish	HS	Physical Fitness (1)	BC	Mgnt. 59 Personnel Management (3)	BC
Physical Science or Chemistry	HS	P.E. or Elective	HS	Acctg. 53B (3) to Accounting	BC	Elective (3)	BC
Typing/Computer	ROP	Technical Math (3)	C	Elective (3)	BC/C	Elective (3)	BC
Ag. Bus. 2—Ag. Bus. Management (3)	BC/C	Ag. Bus. 4—Ag. Acctg. & Farm Mngt. (3)	BC/C				

CERTIFICATE OF COMPETENCY IN TYPING	HIGH SCHOOL DIPLOMA AND/OR CERTIFICATE OF COMPETENCY IN AGRICULTURE	CERTIFICATE OF COMPETENCY IN THE USE OF COMPUTERS IN AGRICULTURE	ASSOCIATE OF SCIENCE DEGREE IN AGRICULTURE BUSINESS

DIPLOMA/CERTIFICATE/DEGREE

WHERE COURSES WILL BE TAUGHT (SITE):

AGRICULTURE CENTER -- C
BAKERSFIELD COLLEGE — BC
HIGH SCHOOL CAMPUS — HS
REGIONAL OCCUPATIONAL PROGRAM — ROP

NO. OF COLLEGE UNITS INDICATED IN: ( )

SUGGESTED ELECTIVES

AN. S. 1 — INTRO. TO ANIMAL HUSBANDRY	CRP.S. 4 — ADVANCED TREES & VINES	BUS. A. 1A — PRINCIPLES OF ACCOUNTING (3)
AN. S. 2 — BEEF PRODUCTION	MECH. AG. 1 — INTRO. AGRIC. MECH.	BUS. A. 1B — PRINCIPLES OF ACCOUNTING (3)
AN. S. 3 — SHEEP PRODUCTION	MECH. AG. 2 - AG. EQUIPMENT SER. & OPER.	ACCTG. 54 — PAYROLL ACCOUNTING (3)
CRP.S.1 — PRINCIPLES CROP PRODUCTION	ORNMENTAL HORTICULTURE 2 — NURSERY MNGNT.	ACCTG. 3 — TAX ACCOUNTING
CRP.S. 2 — ALFALFA & FOR. CROPS	ORNMENTAL HORTICULTURE 3 — PLANT I. D.	BUS. A. 18A — BUSINESS LAW (3)
CRP.S. 3 — TREES & VINES	ORN. HORT. 4 - PLANT IDENTIFICATION	INSUR. 21 — PRINCIPLES OF INSURANCE (3)

* Courses to be designed

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KERN HIGH SCHOOL DISTRICT AND BAKERSFIELD COLLEGE
CROP SCIENCE

GRADE 11 FALL

COURSES	SITE
American History	HS
English	HS
Mathematics	HS
Physical Science or Chemistry	HS
Typing/Computer Intro.	ROP
Ag. Bus. 1—Intro. to Cal. Ag. (3)	C

GRADE 12 FALL

COURSES	SITE
American Government	HS
English	HS
Conversational Spanish	HS
P.E. or Elective	HS
Technical Math (3)	C
Crop.S. 1—Prin. of Crop Production (3)	C

GRADE 13 FALL

COURSES	SITE
English-Composition	BC
Humanities	BC
Crop.S. 3—Trees & Vines	C
Ag. Bus. 2—Ag. Bus. Management (3)	BC
Elective (3)	BC/C

GRADE 14 FALL

COURSES	SITE
English	BC
Behavioral Science (2)	BC
Physical Fitness (1)	BC
Crop.S. 5—Weed Control (3)	C
Crop.S. 6—Soils (3)	C
Elective (3)	BC/C

GRADE 11 SPRING

COURSES	SITE
American History	HS
English	HS
Mathematics	HS
Physical Science or Chemistry	HS
Crop.S. 7—Irrigation (3)	C
Mech. Ag. 2—Equip. Ser. & Opr. (3)	C
Typing/Computer Intro.	ROP

GRADE 12 SPRING

COURSES	SITE
American Government	HS
English	HS
Conversational Spanish	HS
P.E. or Elective	HS
Technical Math (3)	C
Crop.S. 2—Alfalfa & For. Crop (3)	C

GRADE 13 SPRING

COURSES	SITE
English-Speech (3)	BC
Crop.S. 4—Ad. Trees Crops & Vines (3)	C
Mech. Ag. 6—Farm Fabrication (3)	C
Elective (3)	BC/C
Elective (3)	BC/C

GRADE 14 SPRING

COURSES	SITE
Humanities (3)	BC
Fine Arts (3)	BC
Physical Fitness (1)	BC
Crop.S. 8—Entomology (3)	C
Mech. Ag. 3—Farm Power (3)	C
Elective (3)	BC/C

DIPLOMA/CERTIFICATE/DEGREE			
CERTIFICATE OF COMPETENCY IN TYPING	HIGH SCHOOL DIPLOMA AND/OR CERTIFICATE OF COMPETENCY IN FIELD CROPS PRODUCTION UPON COMPLETION OF GRADE 12 SPRING SEMESTER	CERTIFICATE OF COMPETENCY IN TREE AND VINE CROPS AT THE END OF GRADE 13	ASSOCIATE OF SCIENCE DEGREE IN CROP PRODUCTION CERTIFICATE IN AGRONOMY

WHERE COURSES WILL BE TAUGHT (SITE)

AGRICULTURE CENTER — C
BAKERSFIELD COLLEGE — BC
HIGH SCHOOL CAMPUS — HS
REGIONAL OCCUPATIONAL PROGRAM — ROP

NO. OF COLLEGE UNITS INDICATED IN:

( )

SUGGESTED ELECTIVES

AGRICULTURE BUSINESS 3—AGRICULTURE MARKETING & ECONOMICS
AGRICULTURE BUSINESS 4—ACCOUNTING & FARM MANAGEMENT
AGRICULTURE BUSINESS 5—AGRICULTURE COMPUTERS
AGRICULTURE BUSINESS 6—AGRICULTURE LABOR RELATIONS
ANIMAL SCIENCE 1—INTRODUCTION TO ANIMAL SCIENCE
MECHANIZED AGRICULTURE 4—FARM ENGINES
MECHANIZED AGRICULTURE 5—FLUID & PNEUMATIC POWER
MECHANIZED AGRICULTURE 7—FARM TRACTORS
MECHANIZED AGRICULTURE 8—FARM SMALL ENGINES
ORNMENTAL HORTICULTURE 1—PLANT PROPAGATION
WELDING 1—OXY/ACETYLENE
WELDING 538-ARC

KERN HIGH SCHOOL DISTRICT AND BAKERSFIELD COLLEGE
MECHANIZED AGRICULTURE

GRADE 11 FALL		GRADE 12 FALL		GRADE 13 FALL		GRADE 14 FALL	
COURSES	SITE	COURSES	SITE	COURSES	SITE	COURSES	SITE
American History	HS	American Government	HS	English-Composition (3)	BC	English-Technical Writing (3)	BC
English	HS	English	HS	Humanities (3)	BC	Behavorial Science (3)	BC
Mathematics	HS	Conversational Spanish	HS	Mech. Ag. 5--Fluid Pneumatic Power (3)	C	Physical Fitness (1)	BC
Physical Science or Chemistry	HS	P.E. or Elective	HS	Welding 530--ARC (3)	BC	Mech. Ag. 7--Farm Tractors (3)	C
Ag. Bus. 1--Intro. to Cal. Ag. (3)	C	Technical Math (3)	C	Auto 1--Basic Auto (3)	BC	Elective (3)	BC/C
		Mech. Ag. 3--Farm Power (3)	C	Elective (3)	BC/C	Elective (3)	BC/C

GRADE 11 SPRING		GRADE 12 SPRING		GRADE 13 SPRING		GRADE 14 SPRING	
COURSES	SITE	COURSES	SITE	COURSES	SITE	COURSES	SITE
American History	HS	American Government	HS	English-Speech (3)	BC	Humanities (3)	BC
English	HS	English	HS	Mech. Ag. 6--Farm Fabrication (3)	C	Fine Arts (3)	BC
Mathematics	HS	Conversational Spanish	HS	Mech. Shop 1--Elem. (3)		Physical Fitness (1)	BC
Physical Science or Chemistry	HS	P.E. or Elective	HS	Elective (3)	BC/C	Mech. Ag. 8--Farm Small Engines (3)	C
Mech. Ag. 1--Intro. to Ag. Mech. (3)	C	Technical Math (3)	C	Elective (3)	BC/C	Elective (3)	BC/C
Mech. Ag. 2--Equip. Ser. & Opr. (3)	C	Mech. Ag. 4--Farm Engines (3)	C				

CERTIFICATE OF COMPETENCY IN SERVICE AND OPERATION UPON COMPLETION OF GRADE 11, SPRING SEMESTER	HIGH SCHOOL DIPLOMA AND/OR CERTIFICATE OF COMPETENCY IN ENTRY LEVEL FARM MECHANICS	CERTIFICATE OF COMPETENCY IN FABRICATION AND REPAIR	ASSOCIATE OF SCIENCE DEGREE IN MECHANIZED AGRICULTURE

DIPLOMA/CERTIFICATE/DEGREE

WHERE COURSES WILL BE TAUGHT (SITE):

AGRICULTURE CENTER -- C
BAKERSFIELD COLLEGE -- BC
HIGH SCHOOL CAMPUS--HS
REGIONAL OCCUPATIONAL PROGRAM -- ROP

NO. OF COLLEGE UNITS INDICATED IN:

( )

SUGGESTED ELECTIVES

AGRICULTURE BUSINESS 2--AGRICULTURE BUSINESS MANAGEMENT
AGRICULTURE BUSINESS 5--AGRICULTURE COMPUTERS
ANIMAL SCIENCE 1--INTRODUCTION TO ANIMAL SCIENCE
CROP.S. 1--PRINCIPLES OF CROP PRODUCTION
CROP. S. 3--TREES & VINES
CROP. S. 6--SOILS
CROP. S. 7--IRRIGATION
CROP. S. 8--ENTOMOLOGY
ORNAMENTAL HORTICULTURE 4--PLANT IDENTIFICATION
AUTOMOBILE 102 B--AUTOMOBILE ENGINES MACHINERY
MACHINE SHOP 530--ADVANCED MACHINE SHOP
MECHANICAL TECHNICAL 59A--BASIC HYDRAULIC FLUID MECHANICAL
WELDING 1--OXY/ACETYLENE
WELDING 74--TIG AND MIG

APPENDIX

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KERN HIGH SCHOOL DISTRICT AND BAKERSFIELD COLLEGE
ORNAMENTAL HORTICULTURE

GRADE 11 FALL		GRADE 12 FALL		GRADE 13 FALL		GRADE 14 FALL	
COURSES	SITE	COURSES	SITE	COURSES	SITE	COURSES	SITE
American History	HS	American Government	HS	English-Composition (3)	BC	English-Technical (3)	BC
English	HS	English	HS	Humanities	BC	Behavorial Science (3)	BC
Mathematics	HS	Conversational Spanish	HS	Orn. Hort. 4--Plant Identification (3)	BC	Physical Science (3)	BC
Physical Science or Chemistry	HS	P.E. or Elective	HS	Crop.S. 6--Soils (3)	C	Orn. Hort. 6--Landscape Cont./Maint. (3)	BC
Ag. Bus. 1--Intro. to Cal. Ag. (3)	C	Technical Math (3)	C	Mech. Ag. 1--Intro. to Ag. Mech. (3)	C	Crop.S. 7--Irrigation (3)	C
		Ag. Bus. 2--Ag. Bus. Management (3)	BC			Mech. Ag. 6--Farm Fabrication (3)	C

GRADE 11 SPRING		GRADE 12 SPRING		GRADE 13 SPRING		GRADE 14 SPRING	
COURSES	SITE	COURSES	SITE	COURSES	SITE	COURSES	SITE
American History	HS	American Government	HS	English-Speech (3)	BC	Humanities (3)	BC
English	HS	English	HS	Orn. Hort. 5--Land. Design (3)	BC	Fine Arts (3)	BC
Mathematics	HS	Conversational Spanish	HS	Crop.S. 8--Entolomogy (3)	C	Physical Fitness (1)	BC
Physical Science or Chemistry	HS	P.E. or Elective	HS	Mech. Ag. 2--Ag. Equip. Ser. & Oper. (3)	C	Orn. Hort. 7--Turf Management (3)	BC
Orn. Hort. 1--Plant Propegation (3)	BC	Technical Math (3)	C	Ag. Bus. 3--Ag. Marketing & Economics (3)	BC	Mech. Ag. 4--Farm Engines (3)	C
Orn. Hort. 2--Nursery Management (3)	BC	Orn. Hort. 3--Plant Identification	BC	Elective (3)	BC/C	Ag. Bus. 5--Agriculture Computers (3)	BC
						Elective (3)	BC/C

CERTIFICATE OF COMPETENCY IN PLANT CARE AND MAINTENANCE	HIGH SCHOOL DIPLOMA AND/OR CERTIFICATE OF COMPETENCY IN NURSERY MANAGEMENT UPON COMPLETION OF GRADE 12 SPRING SEMESTER	CERTIFICATE OF COMPETENCY IN LANDSCAPE DESIGN	ASSOCIATE OF SCIENCE DEGREE IN ORNAMENTAL HORTICULTURE AND/OR CERTIFICATE OR COMPETENCY IN LANDSCAPE MAINTENANCE/TURF

DIPLOMA/CERTIFICATE/DEGREE

WHERE COURSES WILL BE TAUGHT (SITE):

AGRICULTURE CENTER — C
BAKERSFIELD COLLEGE — BC
HIGH SCHOOL CAMPUS -- HS
REGIONAL OCCUPATIONAL PROGRAM — ROP

NO. OF COLLEGE UNITS INDICATED IN: ( )

SUGGESTED ELECTIVES

AGRICULTURE BUSINESS 4--AGRICULTURE ACCOUNTING & FARM MANAGEMENT
AGRICULTURE BUSINESS 6--AGRICULTURE LABOR RELATIONS
CROP.S. 5--WEED CONTROL
MECHANICAL AGRICULTURE 3--FARM POWER
MECHANICAL AGRICULTURE 5--FLUID & PNEUMATIC POWER
WELDING 1--OXY ACETYLENE
WELDING 53B-ARC

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